

CLAIMS

1. A method in a communication system operating in a licensed radio frequency band and an unlicensed radio frequency band comprising:
exchanging traffic information between a base station and a mobile station
5 on at least one radio channel in the unlicensed radio frequency band; and
exchanging control information that is associated with the traffic information, in the licensed radio frequency band.

2. The method according to claim 1, wherein exchanging traffic information
10 further comprises exchanging traffic information on a traffic channel in the unlicensed radio frequency band.

3. The method according to claim 2, wherein the traffic channel includes a plurality of frequencies of a frequency hopping pattern.

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4. The method according to claim 2, wherein the traffic channel is a code division multiple access channel.

5. The method according to claim 2, wherein the traffic channel is a
20 wideband code division multiple access channel.

6. The method according to claim 2, wherein the control information that is associated with the traffic information is exchanged on a dedicated channel in the licensed radio frequency band.

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7. The method according to claim 6, wherein the dedicated channel in the licensed radio frequency band includes a stand alone dedicated control channel and a slow associated control channel.

8. The method according to claim 2, wherein a channel in the licensed radio frequency band includes a slow associated control channel and an on-demand fast associated control channel.

5 9. The method according to claim 8, wherein the slow associated control channel is dedicated to a first mobile station of a plurality of mobile stations, and wherein the on-demand fast associated control channel is shared between the plurality of mobile stations.

10 10. The method according to claim 9, wherein a request for use of the shared on-demand fast associated control channel by a mobile station of the plurality of mobile stations is transmitted on the slow associated control channel.

15 11. The method according to claim 9, wherein control of the use of the on-demand fast associated control channel between the plurality of mobile stations is by a use field or a grant field encoded on a dedicated slow associated control channel.

20 12. The method according to claim 1, wherein the control information is exchanged on a first control channel in the licensed radio frequency band, the first control channel including a second control channel that is dedicated to a first mobile station of a plurality of mobile stations and a third control channel that is shared between the plurality of mobile stations.

25 13. The method of claim 1, further comprising transmitting traffic channel conditions of at least one traffic channel in the unlicensed radio frequency band over an uplink control channel in the licensed radio frequency band.

30 14. The method according to claim 1, further comprising transmitting control channel conditions of at least one control channel in the licensed radio frequency band over a control channel in the licensed radio frequency band.

15. The method according to claim 13, transmitting control channel conditions of at least one control channel in the licensed radio frequency band over a control channel in the licensed radio frequency band.

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16. The method according to claim 13, further comprising receiving control information over a downlink control channel, wherein the control information is related to the traffic information in the unlicensed radio frequency band.

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17. The method according to claim 3, further comprising transmitting a frequency hopping pattern of all mobile stations communicating with the communication system on a control channel in the licensed radio frequency band.

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18. The method according to claim 1, wherein the control information exchanged over the licensed radio frequency band is handoff information.

19. The method according to claim 1, wherein the control information exchanged over the licensed radio frequency band is an end call message.

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20. The method according to claim 1, wherein the control information exchanged over the licensed radio frequency band is a neighbor list.

21. The method according to claim 1, wherein the control information exchanged over the licensed radio frequency band is a neighbor report.

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22. The method according to claim 1, wherein the control information exchanged over the licensed radio frequency band is a power control message.

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23. The method according to claim 1, wherein the control information exchanged over the licensed radio frequency band is a timing control message.

24. The method according to claim 7, wherein portions of the dedicated control channel are used for traffic when control information is not being sent.

25. A wireless communication device operating in a licensed radio frequency band and simultaneously in an unlicensed radio frequency band comprising:
5 a message scheduling module, that schedules traffic information to be sent in the unlicensed radio frequency band and that schedules control information which is associated with the traffic information to be sent in the licensed radio frequency band; and
10 a transmitter that transmits traffic information over a first channel in the unlicensed radio frequency band, and transmits control information associated with the traffic information over the second channel in the licensed radio frequency band.

26. A method in a base station operative in a licensed radio frequency band and an unlicensed radio frequency band, said method of comprising:
15 transmitting traffic information from a base station on at least one radio channel in the unlicensed radio frequency band; and
transmitting control information that is associated with the traffic information, in the licensed radio frequency band.

20 27. The method according to claim 26, further comprising:
receiving traffic information from a mobile station on at least one radio channel in the unlicensed radio frequency band; and
receiving control information that is associated with the traffic
25 information, in the licensed radio frequency band.

28. A method in a mobile station operative in a licensed radio frequency band and an unlicensed radio frequency band, said method comprising:
receiving traffic information from a base station on at least one radio
30 channel in the unlicensed radio frequency band; and

receiving control information that is associated with the traffic information, in the licensed radio frequency band.